

Cytotoxicity effect of silybin nanoparticles on drug resistant strains of pseudomonas aeruginosa and evaluation of mexB gene expression

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Introduction: *Pseudomonas aeruginosa* is a gram-negative opportunistic pathogene and is a common cause of nosocomial infections. silibinin as an herbal drug has anti-inflammatory and anti-cancer properties that nowadays researcher survey its antibacterial function. Aim of the study was to investigate the anti-bacterial potential of nano-particles silibinin, against clinical isolates of *Pseudomonas aeruginosa* in combination with ciprofloxacin. **Materials and methods:** herein, we isolated 69 clinical strains of *Pseudomonas aeruginosa* patients in Guilan province. After determination of antibiogram by disc diffusion and MIC methods, 10 ciprofloxacin (CP) resistant isolates were treated by ciprofloxacin only and in the combination with nano-particle encapsulated silibinin. Antimicrobial activity of nano-silibinin was assessed by MBC method. After RNA extraction and cDNA synthesis, mexB expression investigated in treated and untreated cells by nano-particles silibinin and ciprofloxacin. **Results:** 3 of isolates were resistant to ciprofloxacin and the highest resistance for ciprofloxacin (CP) was determined in 1024 µg/ml. Our findings showed that a combined nano-silibinin and ciprofloxacin treatment reduced the bacterial counts below the lowest detectable limit after 24h. Also Q-RT-PCR analysis revealed that nano-silibinin led to downregulation of mexB, subsequently increase of ciprofloxacin efficiency in resistance isolates. **Discussion:** our results suggested that nano-silibinin could be inhibits bacterial growth through different mechanism such as mexB downregulation in combination with lower dose of ciprofloxacin (1/2 MIC).

Keywords : *Pseudomonas Aeruginosa*, nano-Silibinin, Ciprofloxacin, MIC, mexB

